



Coastal blue carbon ecosystems

Opportunities for Nationally Determined Contributions.
Policy brief

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Blue Climate
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A project of The Ocean Foundation

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Comments and reactions to the paper are very welcome.

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Building upon a strong foundation of science, partnership and field demonstration, CI empowers societies to responsibly and sustainably care for nature, our global biodiversity, for the wellbeing of humanity. Founded in 1987, CI has headquarters in the Washington, DC area, and nearly 900 employees working in more than 30 countries on four continents, plus 1,000+ partners around the world. www.conservation.org

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About Blue Climate Solutions

Established in 2008, Blue Climate Solutions is a non-profit project of The Ocean Foundation, and is the world's first organization with a sole focus on blue carbon. We promote measurement and valuation of oceanic carbon services to enable development of policies that recognize the climate change mitigation and adaptation roles of the oceans, their ecosystems and inhabitants. www.bluecsolutions.org

About GRID-Arendal

GRID-Arendal is a Norwegian foundation and a centre collaborating with the United Nations Environment Programme (UNEP), supporting informed decision making and awareness-raising. www.grida.no

About The Blue Carbon Initiative

The Blue Carbon Initiative is the first integrated program with a comprehensive and coordinated global agenda focused on mitigating climate change through the conservation and restoration of coastal marine ecosystems. The Initiative currently focuses on mangroves, tidal marshes and seagrasses. The Blue Carbon Initiative brings together governments, research institutions, non-governmental organizations and communities from around the world. <http://thebluecarboninitiative.org>

About UNEP/GEF Blue Forests Project

The UNEP/GEF Blue Forests Project is a global initiative focused on harnessing the values associated with coastal marine carbon and ecosystem services to achieve improved ecosystem management. The project is implemented by the United Nations Environment Programme (UNEP) with partners worldwide and addresses key 'blue forests' knowledge gaps, as well as providing experience and tools to help ensure greater global application in the future. <http://www.gefbblueforests.com/>

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1 Blue Carbon and NDCs. Purpose and context of this paper



This policy brief examines the existing Intended Nationally Determined Contributions (INDCs) and ratified National Determined Contributions (NDCs) with regard to the inclusion of specific efforts addressing blue carbon ecosystems, namely mangroves, tidal saltmarshes and seagrasses, as climate mitigation or adaptation solutions.

Prior to and during the 21st Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC), 163 INDCsⁱ have been submitted and 81 Parties have submitted their NDC^{1,2}. The INDCs are meant to outline Parties' fair and ambitious contributions to addressing climate change and achieving the objective of the Convention as set out in its Article 2 and further strengthened in Article 2 of the Paris Agreement. Amongst other information, Parties were requested to include information on the scope and coverage

ⁱ In this number, the individual Member States of the European Union (EU) are all represented by a single NDC. In this paper, each EU Member State is treated individually.

of their mitigation and adaptation efforts, as well as on methodological approaches including those for estimating and accounting for anthropogenic greenhouse gas emissions and removals.³

As part of the Paris Agreement, Parties are now committed to regularly submit revised NDCs every 5 years, with a review process that is intended to continually increase ambition (Art 4.3 and 4.9 of the Paris Agreement). For the time being, the INDCs submitted by a country prior and during COP21 will automatically count as its first NDC when the country ratifies the Paris Agreement, unless decided otherwise.⁴

While the current NDCs are a significant contribution, the existing commitments will not reach the 2°C target necessary to combat climate change. Scientists have calculated that the NDCs collectively will lower greenhouse gas (GHG) emissions but will still allow for a warming of 2.6–3.1 degrees Celsius by 2100.⁵ This reality is recognized in the Paris Agreement, and this policy briefs aims to highlight the opportunity for countries to consider nature-

based solutions beyond what was originally submitted, including recognizing blue carbon as an opportunity to fill this emissions gap.

This brief outlines how Parties have up until now included and addressed the management of coastal wetland (blue carbon) ecosystems in their NDC climate mitigation and adaptation solutions to date. It also offers a short outlook on areas where coastal wetlands contributions can be improved and strengthened in the future, allowing for more ambitious NDC

submissions. In many coastal nations these ecosystems provide a significant mitigation and adaptation value, as a carbon sink and as coastline protection and food security, respectively. Thus, the inclusion of coastal ecosystems can be considered an important asset in a more ambitious revision of the NDC for many Parties.

Highlights:

151 countries contain at least one blue carbon ecosystem (seagrass, saltmarshes or mangroves) and 71 countries contain all three.

Inclusion in NDCs

- 28 countries' NDCs include a reference to coastal wetlands in terms of mitigation
- 59 countries include coastal ecosystems and the coastal zone into their adaptation strategies. This can be viewed as an opportunity to include relevant activities in blue carbon ecosystems (mangroves, saltmarshes and seagrasses) for mitigation ambitions, if relevant and as appropriate

Noting this, there is a significant opportunity to include and expand blue carbon ecosystems clearly into the mitigation section of future, revised NDCs of all coastal countries. Overall the climate mitigation opportunity of blue carbon ecosystems shows as:

If half of the annual coastal wetlands loss was halted, emissions would be reduced by a 0.23Gt CO₂ yr⁻¹. This is equivalent to offsetting the 2013 emissions of Spain.

If coastal wetlands were restored to their 1990 extent, it would have the potential to increase annual carbon sequestration 160Mt CO₂ yr⁻¹ which is the equivalent to offsetting the burning of 77.4 million tonnes of coal.

2 Introduction

2.1 The Paris Agreement and Nationally Determined Contributions

The Paris Agreement was adopted by all 196 Parties to the UNFCCC at COP21 in December 2015. This landmark agreement marked a turning point with nations now striving for a low-carbon economy using innovation in technology, energy, finance, and conservation sectors. The Agreement entered into force on November 4th 2016,⁶ less than one year since its adoption. This is considered extremely fast for an international treaty and signals the overall sense of urgency to address climate change.⁷

One of the most important elements of the Paris Agreement is that countries can independently decide how to lower their emissions through its Nationally Determined Contributions (NDCs). These national level climate action and emissions reduction plans are prepared to reflect countries economic and environmental differences. Each successive NDC is to represent a progression from the previous one, representing the highest possible ambition (Art. 4.3 of the Paris Agreement) and each party shall communicate a revised NDC every five years (Art 4.9 of the Paris Agreement). One of the principles that will be applied to ensure enhanced ambition of these commitments over time includes the principle of “no backsliding.” While it is a non-legal aspect of the Agreement, it indicates that the current level of ambition is the baseline, and that for each review period countries should increase their ambition accordingly.

2.2 Using nature to support climate change mitigation and adaptation.

The contribution of conservation and restoration of ecosystems to climate change mitigation and adaptation are often referred to as nature-based solutions for climate change⁸ or natural climate solutions.⁹ Sustainably managing natural

extractive resources and agricultural lands along with restoring natural or modified ecosystems and conserving the intact systems offer opportunities to address the societal challenges of climate change. Simultaneously these actions provide human well-being and biodiversity co-benefits.¹⁰

Parties can develop their NDC mitigation actions and priorities based on a portfolio of measures including nature-based solutions. The role of ecosystems has been integrated in the UNFCCC since its adoption in 1992, in Art 4.1(d), when referring to the commitments of Parties in the Convention when “taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances.”¹¹

Promote sustainable management, and promote and cooperate in the conservation and enhancement, as appropriate, of sinks and reservoirs of all greenhouse gases not controlled by the Montreal Protocol, including biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems;

As well as the need to address coastal areas through appropriate coastal zone management, in Art 4.1(e):

Cooperate in preparing for adaptation to the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, [...].

The Paris Agreement reiterates ‘the importance of the conservation and enhancement, as appropriate, of sinks and reservoirs of the greenhouse gases referred to in the Convention’ (Art.5.1) and ‘noting the importance of ensuring the integrity of all ecosystems, including oceans, and the protection of biodiversity’ (preamble).

A significant nature-based solution comes from the Land Use, Land Use Change and Forestry (LULUCF) sector. Within this context and specific to the LULUCF sector as part of the UNFCCC, the role of coastal and marine ecosystems for climate mitigation, especially mangroves, has been described over the last couple of years.^{12,13}

Other papers have already looked at NDCs in the context of nature-based solutions. Laurans et al. 2016¹⁴ for example, indicated that 40 NDCs “have placed nature-based solutions in a highly visible position. Most NDCs still fall very short of truly coherent mitigation and adaptation policy programs. The diversity and heterogeneity of the commitments made by the different countries mean that the question of the effective organisation of policies capable of implementing these commitments is still unresolved.”

2.3 Coastal blue carbon. Mitigation and adaptation benefits

Conservation and restoration of coastal ecosystems, specifically tidal salt marshes, seagrass meadows and mangrove forests, are excellent examples of nature-based solutions for climate mitigation and adaptation. These coastal ecosystems sequester and store huge amounts of carbon from our atmosphere, and are often referred to as blue carbon ecosystems. Coastal wetlands draw in carbon as they grow and transfer much of this into the rich organic soils held by their roots.¹⁵

Mitigation

Unlike terrestrial soils, the soils of blue

sediments accrete vertically in response to rising sea level, when ecosystem health is maintained.¹⁸ Therefore, the rate of carbon sequestration and the size of the carbon sink may continue to increase over time.

Adaptation

Coastal wetlands play a unique role in protecting coastlines from the increasing impacts of climate change by absorbing incoming wave energy, providing storm surge protection, and preventing erosion. In some cases, coastal wetlands have proven to be more cost-effective than hard infrastructure like seawalls and levees, as they require less maintenance and may keep pace with sea level rise.^{19,20} Protecting coastal wetlands also comes with a suite of other co-benefits such as spawning grounds for commercial fish, water purification, and local livelihoods.

Climate impacts of coastal wetland losses

Wetlands are being lost at an alarming rate—faster than almost any other habitat on Earth—primarily due to human activity. It is estimated that the amount of CO₂ released annually from degraded or lost wetlands is equivalent to the annual emissions of the United Kingdom.²¹ Losing these systems also means high risks of severe flooding and coastal erosion, thus increasing the vulnerability of millions of people living along the world's coastline.^{22,23} Thus, it is essential and urgent that we protect and restore the world's blue carbon systems.

2.4 Blue carbon opportunities to increase ambitions

Coastal wetlands are a natural carbon sink

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